28 NOV 2018

SE civil sem III CBCS **Q.P. Code: 27302**

3 Hours **80 Marks**

Q 1 is compulsory. Attempt **any three** questions from the remaining questions.

Q.1 Answer **any five** briefly. Each question carries 04 marks. **(20)**

a Define Surveying. State its objective and principles.

b Differentiate between Whole circle bearing (WCB) and Reduced bearing system. If Θ is the WCB, what would be the reduced bearing in all four quadrants?

c Define: i) Reduced level.ii) Backsight. iii) Foresight. iv) Change point.

d Define contour and state any five characteristics of contours.

e Explain the temporary adjustments of a theodolite.

f A tacheometer has a diaphragm with three cross hairs spaced at a distance of 1.15mm. The focal length of the object glass is 23 cm and the distance of the object glass from the trunnion axis is 10 cm.Calculate the tacheometric constants.

Q.2 **(20)**

a A closed compass traverse ABCD was conducted round a lake and the bearings as shown aside were obtained. Determine which of the stations are affected by local attraction and give the values of the corrected bearings. 08

Line	AB	BC	CD	DA
F.B	74° 20'	107° 20'	224° 50'	306° 40'
B.B	256° 0'	286° 20'	44° 50'	126° 0'

b Compare: Surveyors Compass and Prismatic Compass. 04

c A road embankment 30 m wide at top with side slope of 2 to 1 have ground levels at 100 metres interval along line PQ as under: P(153.0),151.8,151.2,150.6,(149.2)Q.The formation level at P is 161.4 m with a uniformly falling gradient of 1 in 50 from P to Q. Find volume of earthwork by prismoidal formula. Assume the ground to be level in c/s . 08

Q.3 **(20)**

a Following is the page of a level book. Fill in the missing data.Apply the usual checks. Σ B.S is 8.445. 10

Station	B.S	I.S	F.S	Rise	Fall	RL	Remarks
1	2.150					450.000	**BM**
2	1.645		?	0.500		?	
3		2.345			?	?	
4	?		1.965	?		?	
5	2.050		1.825		0.400	?	
6		?		?		451.730	
7	(-) 1.690		?	0.120		?	**Inverted staff rdg**
8	?		2.100		?	?	
9			?	?		499.100	

b Explain fly levelling with its procedure and purpose. 05

c Write a note on different axes of a theodolite and their interrelationships for the instrument to be in perfect adjustment.(**Sketch is desirable**.) 05

Q.4

a List the accessories required for Plane Table Survey. Describe the different methods for orientation of the plane table.

b Write short notes on :
   i. Indirect Ranging.
   ii. Measurement of horizontal angle by method of Repetition.

c A 20 m chain was found to be 4 cm too long after chaining 1400 m.It was 8 cm too long at the end of day's work after chaining a total distance of 2420 m.If the chain was correct before commencement of the work, find the true distance.

Q.5

a

Calculate latitudes and departures for the traverse whose details are as shown aside:

Line	Length (m)	WCB
AB	89.31	45°10'
BC	219.76	72°05'
CD	151.18	161°52'
DE	159.10	228°43'
EA	232.26	300°42'

b The above perpendicular offsets were taken at 10 m intervals from a survey line AB to an irregular boundary line. Calculate the area using Simpson's Rule.

Distance (m)	0 (point A)	10	20	30	40	50	60	70	80 (point B)
Offset (m)	2.30	3.80	4.55	6.75	5.25	7.30	8.95	8.25	5.50

c Write down the detailed format of Gale's traverse table.

Q.6

a Initially, a staff was held vertically at a distance of 46.2 m and 117.6 m from the centre of a theodolite fitted with stadia hairs and the staff intercepts with the telescope horizontal were 0.45 m and 1.15 m respectively. The instrument was then set over a station P having RL as 150 m, the height of instrument axis being 1.38 m .The stadia hair readings on a staff held vertically at a station Q with instrument at P were 1.200, 1.930 and 2.650 m respectively, while the vertical angle (depression) was – 9°30'.Find RL of Q & dist. PQ.

b In a 2 plane method exercise, points P and Q are two instrument stations and point R is the point whose elevation is to be known. The values of included angles Θ_P & Θ_Q are 64°30' & 58°15' respectively. The values of vertical angle α_P & α_Q are 20°43'20" & 19°44'55" respectively. The height of instrument at P and Q are 1.450 and 1.550 m respectively while the backsights taken on benchmark (RL = 100.125 m) from P & Q are 1.625 and 1.125 m respectively. Distance PQ is 180 m.Determine the ground elevations of both the instrument station and elevation of point R.

c Explain Main survey line, Base line, Tie line, Check line, main survey station and subsidiary survey station with the help of a neat sketch.